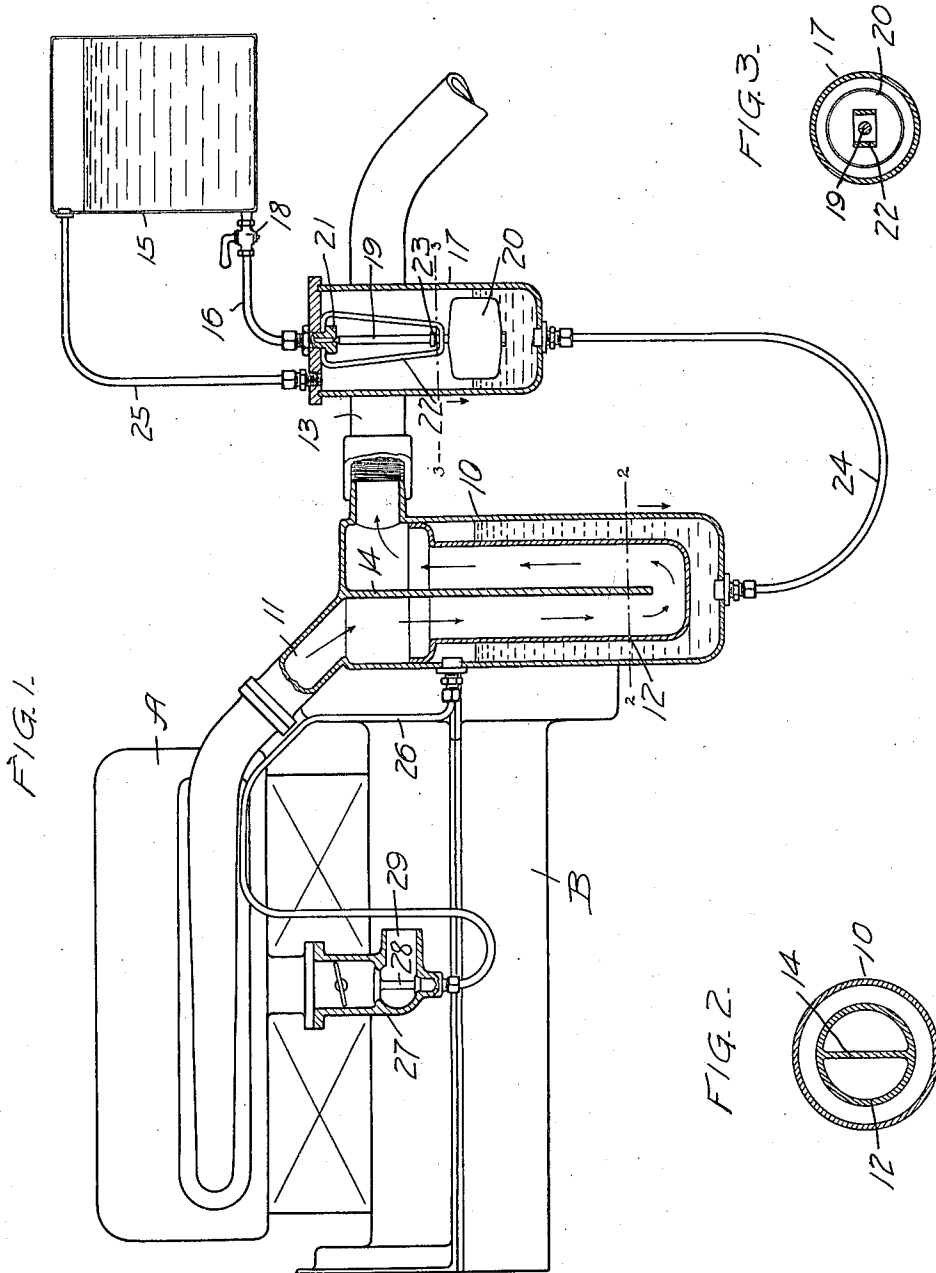


D. J. ANGUS.
GAS GENERATOR.
APPLICATION FILED JUNE 12, 1916.

1,373,477.

Patented Apr. 5, 1921.



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UNITED STATES PATENT OFFICE.

DONALD J. ANGUS, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO JOHN W. ESTERLINE
AND DONALD J. ANGUS, BOTH OF INDIANAPOLIS, INDIANA, COPARTNERS UNDER
THE FIRM-NAME OF ESTERLINE & ANGUS.

GAS-GENERATOR.

1,373,477.

Specification of Letters Patent.

Patented Apr. 5, 1921.

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To all whom it may concern:

Be it known that I, DONALD J. ANGUS, a citizen of the United States, residing at Indianapolis, Marion county, and State of Indiana, have invented and discovered certain new and useful Improvements in Gas-Generators, of which the following is a specification.

My said invention consists in an improved construction of gas generators wherein the gas may be generated by heat applied from any appropriate source, such as the exhaust from an internal combustion engine, and the generation be automatically controlled by the consumption of the gas or exhaust of the gas from the generator, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawing which is made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a view showing my apparatus as applied to an internal combustion engine, the gas generating apparatus being shown in section and the internal combustion engine in elevation as seen from the exhaust side thereof, and Figs. 2 and 3, detail sectional views showing parts of the apparatus on an enlarged scale.

In said drawings, the portions marked A represent the casing of the engine and B the base thereof, both of which are or may be of any approved type or construction.

The gas generating apparatus comprises a vessel 10 preferably of cylindrical form, closed at its top and connected on one side to communicate with the exhaust pipe 11 of an engine and having an exhaust pipe 13 connected with its other side. Mounted within said vessel 10 is a cylinder 12 of less diameter providing an annular chamber between the inner wall of said vessel and the outer wall of said cylinder. The upper end of cylinder 12 is enlarged to fit tightly within the vessel 10 at a point below its top, as shown, and its lower end is closed and is spaced a distance above the bottom of said vessel. The exhaust pipe 13 leads from the upper end of vessel 10 above the top of cylinder 12 and a central partition 14 depends from a central point on the top of said vessel to a point near the lower end of cylinder 12, dividing said cylinder into two parts,

and forming a free passage for the products of combustion from pipe 11 down on one side of said partition 14 and up on the other side, to escape through the pipe 13.

A fuel tank or container 15 is appropriately supported at a point above the level of the generator and communicates by a pipe 16 with a smaller fuel container 17. A shut-off valve 18 is mounted in said pipe 16 near the fuel container 15 and a feed regulating valve 19 with a needle point is mounted on a float 20 and adapted to seat in a valve seat provided in a bushing 21 in the top of container 17 at the inner end of the aperture with which pipe 16 connects. The stem of said valve 19 is mounted in a yoke 22 suitably supported from bushing 21 to have a limited movement, determined by a collar 23 on one side and the float 20 on the other side of said yoke. A pipe 24 leads from the bottom of the fuel container 17 into the bottom of the vessel 10. A pipe 25 leads from the top of container 17 to tank 15 under pressure that might be caused by excessive heat in the generator and show exhaust of gas therefrom.

A pipe 26 leads from the upper end of the annular chamber in the gas generator into the lower end of the casing 27 of the mixing chamber. Said mixing chamber is provided with a double valve 28 and an open air inlet 29 between the two valve seats. The upper end of chamber 27 is connected with the intake manifold in a well known manner.

In operation, valve 18 is opened and the fuel in the tank or container 15 is first allowed to flow into container 17 and from container 17 into the annular chamber between the cylinder 12 and the wall of vessel 10. This continues until the level in vessel 10 and the level in container 17 are the same, when float 20 operates to seat the needle point on the end of the valve stem 19 and stop the further flow of the fuel from tank 15. After the engine is started, the heat from the exhaust gases passing through the cylinder 12 down one side of partition 14 and up the other, results in heating said cylinder 12 to a very high heat which serves to vaporize or generate gases from the liquid fuel in the thin annular space surrounding said cylinder,

which gases are forced by the pressure created through pipe 26 into mixing chamber 27 where they are mixed with air and pass to the engine cylinders for consumption. As soon as the gases begin to generate, the pressure of the gases above the liquid in vessel 10 serves to depress the level of the liquid until its normal level will usually be nearly at the lower end of said cylinder 12, fluctuating up and down as the exhaust of the gas increases or diminishes thus giving a large and variable area of heating surface for the generation of the gases. The fuel from chamber 17 will be supplied automatically as the liquid is converted into gas and consumed by the engine and the process will continue automatically as long as the consumption continues.

By this means it will be seen that the process of generation of the gas from the liquid fuel controls itself automatically, for, when the gas is being exhausted or consumed rapidly from the upper end of chamber 10, the level of the fuel will rise and contact with a larger area of the heating cylinder 12, thus bringing the fuel in contact with a larger area of said heater and generating more gas. When the gases are consumed less rapidly they will accumulate in the upper end of the vessel 10 and the pressure will force down the liquid fuel out of contact with the upper portions of cylinder 12, decreasing the area of said heater which is in contact with the liquid fuel and automatically decreasing gas generation. The head of the liquid fuel flowing from the container 17 will operate against the pressure of the gases in chamber 10 to control the feed of the fuel to said chamber. That is, when the pressure of the gas in chamber 10 falls below the pressure resulting from the head of the fuel, fuel will pass to said chamber through pipe 24 and the float 20 will fall, valve 19 open and an additional supply of fuel will pass through pipe 16 from container 15 into the container 17. When the pressure of the gas in chamber 10 overcomes the head of the flow of the

liquid, then float 12 will rise and close the valve stopping the flow of the liquid. 50

While I have shown and described this generator as applied to a gas engine, for which purpose I regard it as particularly useful, yet it will be understood that it may be applied to any other source of gas consumption or use and that instead of the heat from the exhaust of the engine being utilized as the generating means, heat from any other source may be supplied without departing from the spirit or the scope of my invention. 55 60

Having thus described my said invention, what I claim is:

In a gas generator the combination of a fuel containing chamber fed at the bottom from a supply chamber, said fuel containing chamber having a heating chamber therein open at the top and spaced from the walls of said fuel containing chamber, a baffle extending into and partitioning the heating chamber, means for introducing hot gases on one side of the baffle and discharging them on the other after said gases have twice traveled the length of the heating chamber, said supply chamber being located above the said fuel containing chamber to feed the fuel thereto under an appreciable head, a liquid fuel reservoir located to deliver fuel to said supply chamber under an appreciable head, automatically operated means within the supply chamber for initially maintaining the liquid fuel therein at the same level with that in said fuel containing chamber, said automatic control being also operable to check the feed of liquid from the reservoir upon the generation of back pressure in the fuel-containing chamber, and a vapor outlet from the fuel-containing chamber to a carbureter. 65 70 75 80 85

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this 10th day of June, A. D. nineteen hundred and sixteen. 90

DONALD J. ANGUS. [L. S.]

Witness:

E. W. BRADFORD.